REMARKS/ARGUMENTS

Claims 1-20 were pending in this application. Claims 1-20 remain pending after entry of this amendment. The Office Action rejected claims 1-20 under 35 U.S.C. § 102(b) as being anticipated.

Rejections under 35 U.S.C. § 102(b)

The Office Action rejected claims 1-20 under 35 U.S.C. § 102(b) as being disclosed or anticipated by Chadwick et al. entitled "Layered Construction for Deformable animated Characters" (hereinafter Chadwick). The Office Action alleges that all claim limitations are taught or disclosed by Chadwick. Applicants respectfully traverse the rejections and request reconsideration and withdrawal of the rejections based on Chadwick.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. Applicants respectfully contend that Chadwick fails to disclose at least one claimed element from each of the claims 1-20.

Claim 1

Claim 1 recites a method for simulating relative motion of objects in computer animation. Two objects are provided, namely, a "kinematic object" and at least one "dynamic object." As described in the specification of the application, a kinematic object is generally an object whose motion is specified by for example an animator. A dynamic object is an object whose motion may be responsive to the kinematic object. As recited in claim 1, the motion of the dynamic object is influenced by the motion of the kinematic object and the motion of the dynamic object is simulated using a physically-based numerical technique. As further recited in claim 1, the motion of the dynamic object is manipulated in response to the motion of the kinematic object when the motion of the kinematic object exceeds a predetermined threshold such that the motion of the dynamic object is influenced differently by the motion of the kinematic object when the motion of the kinematic object exceeds the predetermined threshold.

Accordingly, the influence of the kinematic object on the dynamic object is different when the motion of the kinematic object exceeds the predetermined threshold and when it does not.

For example, the manipulation of the motion of the dynamic object, as recited in claim 1, may be used to ensure desired motion for a dynamic object even when the motion of the kinematic object is unrealistic. Consider an animation of a superhero (the kinematic object) wearing a cape (the dynamic object). The motion of the cape may be modeled based upon and influenced by the motion of the superhero. However, this modeling may achieve undesirable effects for the cape (as depicted in Fig. 1b and described in the application in paragraphs [0004] through [0008]) when the superhero performs exaggerated or unrealistic motion such as accelerating over 3Gs (3Gs may be set as the threshold). According to the invention recited in claim 1, the motion of the cape may be manipulated to achieve the desired motion. The motion of the cape may be manipulated such that motion of the cape is influenced differently by the motion of the superhero when the motion of the superhero exceeds the threshold (e.g., 3Gs). Applicants submit that at least the above-discussed concepts recited in claim 1 are not disclosed or anticipated by Chadwick.

Chadwick provides a system for multi-layered construction and animation of deformable characters. (Chadwick: Page 245, Abstract; Page 250, Summary). In Chadwick, once a layered character is constructed, only the underlying skeleton of the layered character need be scripted for an animation. The system, in Chadwick, automatically generates shape dynamics, such as shape transition and shape appearance. (Chadwick: Page 245, bottom of left column and top of right column). The shape transition and shape appearance described by Chadwick provide, for example, volumetric muscle bulging, dynamic fatty tissue response, and creasing at the joint. (Chadwick: Page 245, right column).

Applicants submit that Chadwick is not concerned about simulating relative motion between two objects. While Chadwick describes that motion animation can be achieved using kinematics or dynamic simulation, Chadwick does not teach anything about relative motion of objects and/or about manipulating motion of a dynamic object when the motion of a kinematic object exceeds a threshold, as recited in claim 1. In particular, Chadwick states that the layered approach is designed to support motion generated by simulation models while also

providing precise control of the transition of the character's form. (Chadwick: Page 244, Section 1.3, left column, last four lines of last paragraph). The use of kinematics and dynamic simulation referenced in Chadwick for imparting motion to an animated object is well known in the animation field. Unlike claim 1, however, Chadwick fails to teach relative motion between a kinematic object and a dynamic object, and for manipulating the motion of the dynamic object when the motion of the kinematic objects exceeds a threshold value such that the motion of the dynamic object is influenced differently by the motion of the kinematic object when the motion of the kinematic object exceeds the predetermined threshold.

The Office Action alleges that item seven (Chadwick: Page 248, left column, lines 1-2) discloses the feature of claim 1 of manipulating the motion of the dynamic object when the motion of the kinematic objects exceeds a threshold value such that the motion of the dynamic object is influenced differently by the motion of the kinematic object when the motion of the kinematic object exceeds the predetermined threshold. Applicants respectfully disagree. Applicants submit that Chadwick does not teach manipulating the motion of the dynamic object when the motion of the kinematic objects exceeds a threshold value (e.g., controlling the motion of the cape when the superhero accelerates upwards at non-realistic speeds) as recited in claim 1. Instead, Chadwick describes that the transition and appearance behaviors of the muscle and skin layers are modeled and influenced based on the position of the articulated skeleton layer. For example, Chadwick describes that tendon deformations modeling the bending at the joint are determined based on the bisection angle of the joint. (Chadwick: Page 247, item one of lower left column). In other words, in Chadwick, the modeling of the tendons is based on the angle, or position, of the joint -- not on the motion of a kinematic object as recited in claim 1. Chadwick thus fails to teach manipulating the motion of a dynamic object when the motion of the kinematic object (which influences the motion of the dynamic object) exceeds a predetermined threshold such that the motion of the dynamic object is influenced differently by the motion of the kinematic object when the motion of the kinematic object exceeds the predetermined threshold as recited in claim 1.

Further, Applicants submit that Chadwick discloses changing the appearance of the character based on a threshold angle or position. In Chadwick, the position of the control

points of the tendon free form deformations are resolved for each frame by a different angle once the threshold angle is passed (e.g., bisection angle of the joint in item 1 on Chadwick: Page 247 vs. bisection of the difference between the joint angle and the threshold angle in item 8 on Chadwick: Page 248). Thus Chadwick teaches changing the appearance of the character (e.g., forming a crease) based on the angle or position of the joint. (Chadwick: Page 248, right column, item 8). However, unlike claim 1, Chadwick does not teach anything about the method of manipulating the motion of an object when the predetermined threshold is exceeded by the motion of another object in claim 1.

In light of the above, Applicants submit that at least the feature of manipulating the motion of the dynamic object, as recited in claim 1, is not taught or suggested by Chadwick. Applicants thus submit that claim 1 is patentable over Chadwick.

Claims 2-20

Applicants submit that independent claims 13, 17, 18, and 19 are allowable for at least a similar rationale as discussed above for the allowability of claim 1, and others. Applicants submit that dependent claims 2-12, 14-16, and 20 that depend from claims 1, 13, and 19, respectively, are allowable for at least a similar rationale as discussed above for the allowability of claims 1, 13, and 19. Applicants submit that the dependent claims are also patentable for additional reasons.

Additional Remarks

Applicants draw the Examiner's attention to an Information Disclosure Statement filed in the above-referenced application on September 6, 2005.

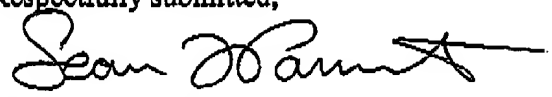
Further, the Applicants draw the Examiner's attention to related application serial no. 09/794,057 filed on February 28, 2001 (Atty. Docket No. 021751-001900US) and related application serial no. 10/636,514 filed on August 6, 2003 (Atty. Docket No. 021751-001910US). The Applicants respectfully request the Examiner to review these related applications.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,



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